REMARKS

By this amendment, Claims 1, 9 and 10-18 has been amended, and no claims have been canceled or added. Thus claims 1-18 are currently pending. The amendments to the claims as indicated herein do not add any new matter to this application. Furthermore, amendments made to the claims herein are made to exclusively improve the identification of the subject matter of which patent protection is desired and not for the purpose of overcoming any alleged prior art.

ALL PENDING CLAIMS CONFORM TO 35 U.S.C. § 101

Claims 1-18 have been rejected under 35 U.S.C. § 101 because the claims are allegedly directed towards non-statutory subject matter. More specifically, the Final Office Action states that:

> ... the claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They [the claims] are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material per se. Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional desciptive material.

Both types are nonstatutory when claimed as descriptive material per se."

Claims 1-9 are directed towards a method, which is a process. A process is expressly identified as statutory subject matter under 35 U.S.C. § 101. Therefore, Claims 1-9 are directed towards statutory subject matter. Claims 1-9 feature approaches for reducing the amount of time and resources that are required to recover a database system. Claim 1 recites "**storing a checkpoint value** that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks; and

writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a user-specified value that corresponds to how much work will be required during a redo phase of recovery."

Claim 1 is a process that 'store[s] a checkpoint value.' "Storing a checkpoint value" clearly requires a tangible embodiment that is neither "functional descriptive material" or "nonfunctional desciptive material." Thus, the initial limitation of Claim 1 traverses the under 35 U.S.C. § 101 rejection.

In addition, Claim 1 continues "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value." "Writing changes from volatile to non volatile memory" is a tangible and useful act which falls within the statutory subject matter under 35 U.S.C. § 101. Thus, Claim 1 is not "functional descriptive material" or "nonfunctional descriptive material". Consequently, it is respectfully submitted that Claim 1, and dependent claims 2-9, are directed towards statutory subject matter.

A computer-readable medium that carries instructions that may be executed by a computer is an article of manufacture, and as such, is expressly recognized by 35 U.S.C. § 101 as being patentable subject matter. The Patent Office has long recognized that a computer-readable medium, which carries one or more sequences of instructions, which when executed, cause the performance of steps that are patentable subject matter, is itself patentable (see *In re Beauregard*). Claims 10-18 are each alleged to be non-statutory for "claiming nonfunctional descriptive material ... stored on a computer readable medium." However, a computer-readable medium that carries one or more sequences of instructions, which when executed, stores a checkpoint value and writes changes from volatile to non volatile memory is a tangible and useful result, as explained above. Because the step of storing a checkpoint value and writing

changes results in a tangible and useful result, the limitation is not nonfunctional descriptive material. Furthermore, each computer-readable medium claim has been amended to "computer-readable storage medium" to further clarify that the computer-readable storage medium is tangibly embodied. Therefore, Claims 1-18 must be directed towards statutory subject matter under 35 U.S.C. § 101.

Therefore, the rejection of Claims 1-18 is respectfully requested to be withdrawn.

THE CITED ART DOES NOT TEACH OR DISCLOSE EACH LIMITATION OF THE PENDING CLAIMS

Claims 1-3, 6-12 and 15-18 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over applicants' background, specification page 1, paragraph [004] to page 9, paragraph [0028], (Applicants' Admitted Prior Art) ("*APA*") in view of U.S. Patent 5,721,918 issued to Nilsson et al., ("*Nilsson*") and in further view of U.S. Patent 5,524,205 issued to Lomet et al. ("*Lomet*"). Applicants respectfully traversed.

Even if the cited art were to be properly combined, each of the pending claims recites at least one element that is not disclosed, taught, or suggested by the cited art, either individually or in combination.

Claim 1

Claim 1 recites:

> "storing a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks; and
> **writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a user-specified value that corresponds to**

how much work will be required during a redo phase of recovery." (emphasis added)

At least the above-bolded element of Claim 1 is not disclosed, taught, or suggested by *APA*, *Nilsson* or *Lomet*, either individually, or in combination.

Lomet fails to disclose the limitation in Claim 1 of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a user-specified value that corresponds to how much work will be required during a redo phase of recovery." The Final Office Action admits that "APA [and] Nilsson [also] fail to explicitly disclose" this limitation.

There is no teaching or suggestion anywhere in *Lomet* of writing changes from volatile memory to nonvolatile memory based on a user-specified value that corresponds to how much work will be required during a redo phase of recovery. Rather, the sections identified by the Final Office Action disclose copying "dirty" blocks from volatile to persistent storage and an analysis phase to update a system state. However, *Lomet* fails to discuss or suggest any *user-specified value that corresponds to how much work will be required during a redo phase of recovery*, let alone writing changes from volatile memory to non-volatile memory based on such a user-specified value.

Furthermore, the Advisory Action alleges that *Lomet* discloses "minimize[ing] the information which must be stored to undo transactions in case of crashes or failures" (*Lomet*, col. 2, lines 49-51). However, *Lomet* explicitly recites that this is the *object* of the invention. *Lomet* fails to teach or disclose that the limitation cited above is *how* minimizing the information is performed. Instead, *Lomet* achieves this objective by storing only which transactions have been processed and which transactions have not been processed without any mention of a user-specified value that corresponds to how much work will be required during a redo phase of

recovery. Consequently, the element of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a user-specified value that corresponds to how much work will be required during a redo phase of recovery" is not disclosed, taught, or suggested by *Lomet*.

The Advisory Action also alleges that APA discloses "reflecting in the database updates, in which redo records in the redo log file are sequentially processed." (*Page 5, Paragraph [0016]*). However, this too, does not teach or disclose the limitation recited by Claim 1 of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a user-specified value that corresponds to how much work will be required during a redo phase of recovery." The APA does not mention a user-specified value that corresponds to how much work will be required during a redo phase of recovery, much less writing changes from volatile memory to non-volatile memory based on such a user-specified value. Consequently, the above-bolded element is not disclosed, taught, or suggested by *APA*.

As at least one element is not disclosed, taught, or suggested by the *APA*, *Nilsson*, or *Lomet*, either individually or in combination, it is respectfully submitted that Claim 1 is patentable over the cited art and is in condition for allowance.

Claim 9

Claim 9 recites:

> "storing a checkpoint value that indicates which records of a plurality of records have to be processed after the failure, wherein the plurality of records indicate changes for a plurality of data blocks;
> determining a required recovery time, wherein the required recovery time indicates a maximum length of time that is to be allowed for recovering after said database system failure; and
> **writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on the maximum number of data block reads**

> **that can be performed in the required recovery time**." (emphasis added)

At least the above-bolded element of Claim 9 is not disclosed, taught, or suggested by *APA, Nilsson, or Lomet*, either individually, or in combination.

Lomet fails to disclose the limitation in Claim 9 of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on the maximum number of data block reads that can be performed in the required recovery time." The Final Office Action admits that "APA [and] Nilsson [also] fail to explicitly disclose" this limitation.

There is no teaching or suggestion anywhere in *Lomet* of writing changes from volatile memory to nonvolatile memory based on the maximum number of data block reads that can be performed in the required recovery time. Rather, the sections identified by the Final Office Action disclose copying "dirty" blocks from volatile to persistent storage and an analysis phase to update a system state. However, *Lomet* fails to discuss or suggest any *the maximum number of data block reads that can be performed in the required recovery time*, let alone writing changes from volatile memory to non-volatile memory based on such a user-specified value. Furthermore, the Advisory Action alleges that *Lomet* discloses "minimize[ing] the information which must be stored to undo transactions in case of crashes or failures" (*Lomet*, col. 2, lines 49-51). However, *Lomet* explicitly recites that this is the *object* of the invention. *Lomet* fails to teach or disclose that the limitation cited above is *how* minimizing the information is performed. Rather than performing the subject matter recited by this element to minimize the information which must be stored to undo transactions in case of crashes or failures, *Lomet* stores only which transactions have been processed and which transactions have not been processed without any mention of a maximum number of data block reads that can be performed in the required

recovery time. Consequently, the element of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on the maximum number of data block reads that can be performed in the required recovery time" is not disclosed, taught, or suggested by *Lomet*.

The Advisory Action also alleges that APA discloses "reflecting in the database updates, in which redo records in the redo log file are sequentially processed." (*Page 5, Paragraph [0016]*). However, this too, does not teach or disclose the Claim 9 limitation that "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on the maximum number of data block reads that can be performed in the required recovery time," as recited by Claim 9. The APA does not mention a user-specified value that corresponds to how much work will be required during a redo phase of recovery, much less writing changes from volatile memory to non-volatile memory based on such a user-specified value. Consequently, the above-bolded element is not disclosed, taught, or suggested by *APA*.

As at least one element is not disclosed, taught, or suggested by the *APA*, *Nilsson*, or *Lomet*, either individually or in combination, it is respectfully submitted that Claim 9 is patentable over the cited art and is in condition for allowance.

Claims 2-8 and 10-18

Claims 10 and 18 feature limitations similar to those discussed above with respect to Claims 1 and 9 respectively, except that Claims 10 and 18 are recited in computer-readable medium format. Consequently, for at least the reasons given above with respect to Claims 1 and 9, it is respectfully submitted that Claims 10 and 18 are patentable over the cited art and are each in condition for allowance.

Claims 2-8 and 10-17 are dependent claims, each of which depends (directly or indirectly) on one of the claims discussed above. Each of Claims 2-8 and 10-17 is therefore allowable for the reasons given above for the claim on which it depends. In addition, each of Claims 2-8 and 10-17 introduces one or more additional limitations that independently render it patentable. However, due to the fundamental differences already identified, to expedite the positive resolution of this case a separate discussion of those limitations is not included at this time, although the Applicants reserve the right to further point out the differences between the cited art and the novel features recited in the dependent claims.

CONCLUSION

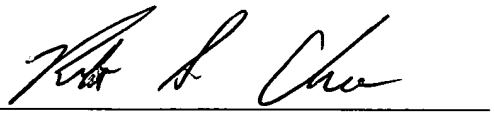
For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Please charge any shortages or credit any overages to Deposit Account No. 50-1302.

Respectfully submitted,
Hickman Palermo Truong & Becker LLP

Dated: March 19, 2007



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